

REMARKS

Applicants acknowledge, with appreciation, Examiner Nguyen's courtesy and professionalism in conducting another telephonic interview on March 21, 2005. During that telephonic interview, Examiner Nguyen agreed that amended claim 1, as presented in the Amendment submitted on April 27, 2005 pursuant to 37 C.F.R. §1.116 would overcome the imposed rejections of record. However, Examiner Nguyen issued an Advisory Action dated April 11, 2005 indicating that the Amendment pursuant to 37 C.F.R. §1.116 filed on April 27, 2005 would not be entered. During a telephonic interview on April 22, 2005, Examiner Nguyen advised that upon updating the search a new reference was found, i.e., published U.S. Patent Application No. 2001/0051420 issued to Besser et al. (Besser et al.). Accordingly, Applicants are submitting concurrently herewith an RCE designating this Amendment as a submission and submitting an Information Disclosure Statement (IDS) listing Besser et al. The reference to Besser et al. is addressed *infra*.

Claims 1 through 23 are pending in this Application. Claim 1 has been amended and claims 25 and 26 cancelled. Care has been exercised to avoid the introduction of new matter. Indeed, adequate descriptive support for the present Amendment should be apparent throughout the originally filed disclosure as, for example, Figs. 4 through 6, and the related discussion thereof in the written description of the specification. Applicants submit that the present Amendment does not generate any new matter issue.

Claim Objections

The Examiner objected to claims 25 and 26, asserting that these claims are duplications of claims 4 and 5, respectively. This objection has been rendered moot by canceling claims 25 and 26.

Claims 1, 2, 4, 5, 21, 22, 25 and 26 were rejected under 35 U.S.C. § 102 for lack of novelty as evidenced by Chooi et al.

In the statement of the rejection, the Examiner again referred to Figs. 1 and 4 through 8, and the related text, asserting the disclosure of a method corresponding to that claimed, including the step of forming a single opening (22) entirely within and defined by side surfaces of the single first dielectric layer 18 and a bottom, referring to Figs. 2 and 4. This rejection is traversed.

Initially, even without the present Amendment the method defined in independent claim 1 comprises the manipulative step of “etching to form a single opening entirely within and defined by side surfaces of the single first dielectric layer and a bottom...”. No such manipulative step is disclosed or suggested by Chooi et al. This is because Chooi et al. etch to form **not a** single opening within one dielectric but a **dual-damascene opening** within **two** dielectric layers. This is not Applicants’ interpretation of the method disclosed by Chooi et al. These are the words of Chooi et al. appearing in column 5, lines 51 through 53 and read as follows:

... etching of a **dual-damascene** interconnect formation consisting of a trench (22) and a via (24), which is **open** to the Cu layer (10). (Emphasis supplied).

Based upon the foregoing it should be apparent that what the Examiner has identified as a single opening 22 is not, in fact, a single opening, but part of a dual-damascene opening which comprises a trench 22 connected to a via 24 with no partition therebetween. A patent disclosure is directed to one having ordinary skill in the art and must be interpreted in the context of the disclosed invention. *Int’l. Rectifier corp. v. IXYS Corp.*, 361 F.3d 1363, 70 USPQ2d 1209 (Fed. Cir. 2004); *Brookhill-Wilk I, LLC v. Intuitive Surgical, Inc.* 334 F.3d 1294, 67 USPQ2d 1132 (Fed. Cir. 2003). It is inconceivable that one having ordinary skill in this particular art (semiconductor fabrication) would have interpreted the single opening in one dielectric layer of the claimed invention as a

portion of a dual-damascene opening in two dielectric layers, ignoring the fact that the dual-damascene opening is a single large opening.

But the disclosed dual-damascene opening does **not** satisfy the requirements of independent claim 1 for being formed entirely within and defined by side surfaces of the **single** first dielectric layer. It is improper to surgically extract a portion of the dual-damascene opening (trench 22) and call that a single opening when it is not, because it is integral with the via hole and connected thereto.

At any rate, as discussed during the March 21, 2004 telephonic interview, independent claim 1 has been amended to clarify that the single opening is formed over an underlying conductive feature and that, upon etching to remove the second barrier layer from the **bottom** of the single opening the underlying conductive feature is exposed. This does not occur in the dual-damascene system of Chooi et al., because the bottom of the identified single opening (22) removed to expose the underlying conductive feature is not entirely within the first dielectric layer (18).

The above argued difference in manipulative steps between the claimed method and the methodology of Chooi et al. undermines the factual determination that Chooi et al. disclose a method identically corresponding to that claimed. *Minnesota Mining & Manufacturing Co. v. Johnson & Johnson Orthopaedics Inc.*, 976 F.2d 1559, 24 USPQ2d 1321 (Fed. Cir. 1992); *Kloster Speedsteel AB v. Crucible Inc.*, 793 F.2d 1565, 230 USPQ 81 (Fed. Cir. 1986). Applicants, therefore submit that the imposed rejection of claims 1, 2, 4, 5, 21, 22, 25 and 26 under 35 U.S.C. § 102 for lack of novelty as evidenced by Chooi et al. is not factually viable and, hence solicit withdrawal thereof.

Claims 3 and 23 was rejected under 35 U.S.C. § 103 for obviousness predicated upon Chooi et al. in view of Chung et al.

This rejection is traversed. Specifically, claim 3 depends from independent claim 1. Applicants incorporate herein the arguments previously advanced in traversing the imposed rejection of claim 1 under 35 U.S.C. § 102 for lack of novelty as evidenced by Chooi et al. The additional reference to Chung et al. does not cure the argued deficiencies of Chooi et al. Accordingly, even if the applied references are combined as suggested by the Examiner, and Applicants do not agree that the requisite fact-based motivation has been established, the claimed invention would not result. *Uniroyal, Inc. v. Rudkin-Wiley Corp.*, 837 F.2d 1044, 5 USPQ2d 1434 (Fed. Cir. 1988).

Applicants, therefore submit that the imposed rejection of claims 3 and 23 under 35 U.S.C. § 103 for obviousness predicated upon Chooi et al in view of Chung et al. is not factually or legally viable and, hence, solicit withdrawal thereof.

Besser et al.

Claim 1 is clearly free of the applied prior art, including the reference to Besser et al. As previously pointed out, the reference to Besser et al. was brought to Applicants' attention during a telephone communication on April 22, 2005. Applicants are reluctant to be placed in a position in which they are compelled to shoot arrows into the dark¹, as they are not aware of the precise reasons the Examiner considers Besser et al. relevant. However, in order to expedite prosecution, claim 1 has been amended by clarifying that the opening is filled forming an overburden on the first barrier layer and subsequently planarized to form a lower metal feature. No such method is disclosed or suggested by Besser et al. Indeed, advertent to Figs. 4 through 6 of Besser et al., it is assumed the Examiner has determined that layer 160 corresponds to the first barrier layer of the present invention. However, layer 160 is **removed prior to filling** the single opening, as should be

¹ In re Oetiker, 977 F.2d 1443, 24 USPQ2d 1443 (Fed. Cir. 1992)

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apparent from paragraph [0033] of Besser et al. Accordingly, the present claims are free of Besser et al.

Applicants acknowledge, with appreciation, the Examiner's allowance of claims 6 through 12. Based upon the arguments submitted *supra*, Applicants submit that the imposed rejections have been overcome and that all active claims are in condition for immediate allowance. Favorable consideration is, therefore, respectfully solicited.

To the extent necessary, a petition for an extension of time under 37 C.F.R. 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account 500417 and please credit any excess fees to such deposit account.

Respectfully submitted,

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